



State of Utah
DEPARTMENT OF NATURAL RESOURCES
Division of Wildlife Resources – Native Aquatic Species

Spotted Frog

(Rana luteiventris)

MONITORING SUMMARY

Central Region
2002



Photo by: Krissy Wilson

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Utah Division of Wildlife Resources
1594 W. North Temple
Salt Lake City, Utah
Kevin Conway, Director



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**Central Region,
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1. Introduction

Spotted frog breeding sites are monitored annually during the spring breeding season. The breeding sites were documented during surveys conducted in 1992 and 1993 by Utah Division of Wildlife Resources (Ross et al. 1993) and have been monitored annually since 1994. The objective of the monitoring program is to monitor spotted frog populations and habitat, determine distribution, and available habitat. Relative abundances of spotted frog populations are based on the number of egg masses counted during the breeding season (Ross et al. 1993, Ross et al. 1994). The estimates are then used to examine population trends based on annual fluctuations. The monitoring program also provides baseline data used to develop management plans to accomplish goals outlined in the Conservation Agreement and Strategy for Spotted Frog (Perkins and Lentsch 1998).

Spotted frog populations in Utah have been separated into three Geographic Management Units (GMU) (Perkins and Lentsch 1998). The GMUs were divided into subunits based on United States Geological Survey (USGS) hydrologic units, and only those subunits contained within the Central Region are discussed in this report.

1.1 Wasatch Front GMU: The Wasatch Front GMU consists of six USGS hydrologic subunits:

1.1.1 Spanish Fork River 16020202: Four spotted frog breeding sites occur within this subunit: Holladay Springs (south of Payson), T-Bone Bottoms (south of Springville), the East Hatchery Pond in Springville, and an additional site was discovered within the Diamond Fork River drainage in 2002.

1.1.2 Utah Lake 16020201: This subunit includes two spotted frog breeding sites in Juab County: One population is located at Mona Springs (part of the Burraston Ponds Wildlife Management Area) and the other is located in wetlands surrounding Burraston Ponds (hereafter referred to as the Burraston Ponds population).

1.1.3 Provo River 16020203: Two spotted frog populations occur within this subunit: one is found in wetlands along the Provo River above Jordanelle Reservoir (Jordanelle/Francis population), and the other occupies wetlands below Jordanelle Reservoir between Jordanelle and Deer Creek Reservoir (Heber Valley population).

1.1.4 Jordan River 16020204: The Jordan River hydrologic unit was surveyed in the 1992 by Ross et al. but no egg masses were found. No surveys have been conducted in the Jordan River drainage in subsequent years.

1.2 Sevier River GMU: The Sevier River GMU consists of three USGS hydrologic subunits.

1.2.1 San Pitch River 1603004: This subunit contains the Fairview spotted frog population, which includes eleven breeding sites that have been monitored annually since 1992.

1.2.2 Middle Sevier River 16030003: Spotted frogs have not been documented in this subunit.

1.2.3 Lower Sevier River 16030005: Spotted frogs have not been documented in this subunit.

1.3 West Desert GMU: The West Desert GMU contains seven hydrologic subunits:

1.3.1 Ibapah Valley 16020306: This subunit contains a large population of spotted frog found throughout the Ibapah Valley. Two monitoring sites were established in 1997 to represent habitat found at each end of the valley. The south Ibapah monitoring site is typified by natural spring sources while the north monitoring site is pasture land that is artificially flooded. In 1998, the owner of part of the south monitoring site denied UDWR access to the property. Consequently, the property was removed as part of the south monitoring site. The north monitoring site originally consisted of two large fields, but in 1998, the west field alone was determined to be more manageable and comparable from year to year since it has dikes that create stable habitat (the east field's habitat is created by flood irrigation which fluctuates throughout the breeding season, thus making comparisons difficult).

1.3.2 Snake Valley 16020301: The border between the UDWR Central and Southern Regions bisects Snake Valley. The Central Region monitors the Miller and Leland Harris Spring populations while the Southern Region monitors the Gandy and Bishop Spring populations.

1.3.3 Tooele Valley 16020304: Spotted frogs were discovered at one location during 2002 sweep surveys. There was no previous documentation of spotted frogs inhabiting this area.

1.3.4 Skull Valley 16020305: It is unknown whether spotted frogs inhabit this subunit currently or historically.

1.3.5 West Great Salt Lake 16020308: Spotted frogs have not been documented in this subunit.

2. Methods

Known breeding sites were surveyed weekly during the breeding season to collect information on the number of egg masses deposited and the development and metamorphosis of tadpoles. Upon locating an egg mass cluster, the number of egg masses within the cluster was recorded. Each cluster was visited weekly thereafter with only new egg masses within the cluster being counted. In addition, age-classes were assigned to all egg masses observed: Age-class 1: the mass is clear, compact, usually submerged, under water, and no development of tadpoles; age-class 2: the mass is cloudy, looser, on the surface of the water, and tadpole development is in progress or almost complete; age-class 3: the mass is a crusty white, looser and possibly broken up, on the surface of the water, and tadpole development is complete. Furthermore, upon locating an egg mass cluster, the depth from the center of the egg mass cluster to the top of the water column and the distance from the center of the cluster to the shore was recorded. Water temperatures, pH, and dissolved oxygen levels were also recorded. The egg mass cluster site was then flagged and labeled. The number of egg masses observed during the breeding season is doubled, and this number represents the effective population size of spotted frog (N_{\square} = the number of breeding individuals that contribute genes to the next generation).

In an attempt to locate new spotted frog populations outside designated monitoring sites, sweep surveys were conducted by traversing the perimeter of ponds and other wetlands while looking for amphibians and egg masses. In ponds with extensive aquatic vegetation, care was taken while walking through the vegetation to avoid harming egg masses and/or frogs. In bogs and willow thickets, researchers spread out and make broad zig-zags through the site to ensure proper coverage of the area. If frogs, tadpoles, or egg masses were observed, their locations were marked on a USGS 1:24,000 quadrangle map. Sweep surveys are generally conducted in

areas surrounding or connected to currently occupied sites, as well as areas that were historically occupied by the spotted frog. Sweep surveys were conducted in 1999 and 2000 in the Wasatch Front and Sevier River GMU's, resulting in additional spotted frog locations at 1) Holladay Springs; 2) Burraston Ponds; 3) above Jordanelle Reservoir; 4) and in the San Pitch drainage near the town of Fairview. These new sites have subsequently been added to the yearly monitoring efforts. Sweep surveys conducted in 2001 in areas south of Mt. Pleasant did not result in any additional spotted frog locations. Portions of the Spanish Fork River, Utah Lake, Tooele Valley, and San Pitch subunits were surveyed in 2002.

3. RESULTS

3.1 Wasatch Front GMU

3.1.1 Spanish Fork River: Weekly monitoring began 29 March 2002 and continued until 25 April 2002. A total of 36 egg masses were observed at monitoring sites, including 27 egg masses at Holladay Springs and 9 egg masses at the Springville Hatchery pond (Table 1). T-Bone Bottoms was surveyed only once this year (April 12, 2002), and no frogs or egg masses were found. The site was mostly dry, with only a little open water present outside of the irrigation ditches. At Holladay Springs, the first egg masses were observed 29 March 2002, and the season peaked during the week of April 1st. Egg mass depth ranged from 1.0 cm to 6.0 cm ($m=3.25$ cm), distance to shore ranged from 0.5 m to 3.0 m ($m=1.5$ m), and water temperature ranged from 14.2 °C to 20.8 °C ($m=17.9$ °C). Dissolved oxygen ranged from 4.07 to 12.66 mg/L ($m=7.76$) and pH ranged from 7.5 to 8.0. The first egg masses were recorded at the Springville Hatchery pond on 1 April 2002, and the season peaked that same week. Egg mass depth ranged from 3 cm to 4 cm ($m=3.5$ cm), distance to shore ranged from .5 m to 4 m ($m=1.75$ m), and water temperature ranged from 19 °C to 21 °C ($m=20$ °C).

A new spotted frog site was located at Holladay Springs during 1999 sweeping efforts, and has subsequently been included in the weekly monitoring. Due to the continued drought situation, this site was completely dry during the breeding season. Thus, the total number of egg masses observed in the Spanish Fork River subunit in 2002 is 36 (Table 1).

On August 5th, UDWR personnel discovered a previously unknown population of spotted frog along a lower reach of Diamond Fork River. Approximately six adult frogs were

discovered. Following the initial discovery, native UDWR personnel briefly surveyed the area, verified the species as spotted frog, and found an additional 30 adults and juveniles.

3.1.2 Utah Lake: Weekly monitoring began on 29 March 2002 and continued until 25 April 2002. A total of 33 egg masses were observed at monitoring sites, including 16 egg masses at Mona Springs and 17 egg masses south of Burraston Ponds (Table 1). The first egg masses were observed at Mona Springs on 3 April 2002, and the season peaked the week of April 8th. Egg mass depth ranged from 1.0 cm to 5.0 cm (m=3.5 cm), distance to shore ranged from 0.10 m to 2.0 m (m=1.05 m), and water temperature ranged from 17.6 °C to 23.8 °C (m=20.2 °C). Dissolved oxygen ranged from 6.82 to 10.6 (m=8.3) and pH was 8.0 at all locations. The first egg masses were observed south of Burraston Ponds on 3 April 2002, and the season peaked that same week. Egg mass depth ranged from 1.0 cm to 2.0 cm (m=1.25 cm) and distance to shore ranged from 0.2 m to 1.0 m (m=0.46 m). Water temperature ranged from 12.6 °C to 20.8 °C (m=15.4 °C) and pH ranged from 7.7 to 8.0 (m=7.8).

New spotted frog sites were located south of Burraston Ponds during 1999 sweeping efforts, and these sites were subsequently included in weekly monitoring. This year, no egg masses were observed at these sites. Leopard frog adults and egg masses were seen at these sites in 2002. Thus, the total number of egg masses observed in the Utah Lake subunit in 2002 is 33 (Table 1).

3.1.3 Provo River: The chytrid fungus *Batrachochytrium dendrobatidis* which causes the amphibian disease chytridiomycosis was detected in February 2002 in a captive population of spotted frog that were taken from the Provo River population and moved indoors at Brigham Young University for research purposes. This is the first detection of chytrid in a Utah population of Columbia spotted frog.

Weekly monitoring began below Jordanelle Reservoir March 16 and continued thereafter until November 15. A total of 557 egg masses were observed (Table 1). Egg masses were first recorded on April 2, and the breeding season peaked the week of April 5.

Weekly monitoring began above Jordanelle Reservoir on April 10th and continued until April 24th. A total of 44 egg masses were observed at monitoring sites (Table 1). Egg masses were first recorded on April 10th, and the breeding season peaked around that same time. Egg mass distance to shore ranged from 0 m to 2.5 m (Avg.=0.62 m).

An additional 260 egg masses were observed at locations discovered during 1999, 2000, 2001 and 2002 sweeps conducted above Jordanelle Reservoir. Thus, the total number of egg masses observed in the Provo River subunit in 2002 was 810: 550 observed at sites below Jordanelle, 44 observed at monitoring sites above Jordanelle, and 216 observed at sites above Jordanelle located during sweeps (Table 1)

3.2 Sevier River GMU

3.2.1 San Pitch River: Weekly monitoring began 27 March 2002 and continued until 24 April 2002. A total of 8 egg masses were observed at monitoring sites (Table 2). The first masses were located on 9 April 2002, and the breeding season peaked that week. Egg mass depth ranged from 3.0 cm to 20.0 cm ($m=6.14$ cm), distance to shore ranged from 0.30m to 1.0m ($m=0.66$ m) and water temperature ranged from 5.7 °C to 14.3 °C ($m=11.1$ °C). Dissolved oxygen ranged from 5.3 to 7.1 mg/L ($m=6.26$) and pH ranged from 7.5 to 8.0 ($m=7.78$).

New spotted frog sites were located during sweeps conducted in 1999 and 2000, and these sites were subsequently included in weekly monitoring. We observed 78 egg masses at these additional sites. Thus, the total number of egg masses observed in the San Pitch subunit in 2002 is 86: 8 observed at monitoring sites, 78 observed at sites located during 1999 and 2000 sweeps (Table 2).

3.3 West Desert GMU

3.3.1 Ibapah Valley: Weekly monitoring began on 20 March 2002 and continued until 16 April 2002. A total of 201 egg masses were observed in this subunit (Table 3). The number of egg masses observed at the south Ibapah monitoring site totaled 183. Egg masses were first recorded at south Ibapah on 20 March 2002, and the breeding season peaked the week of 2 April 2002. Egg mass depth ranged from 0 cm to 5.0 cm ($m=1.28$ cm), distance to shore ranged from 0 m to 7.0 m ($m=1.16$ m), and temperature ranged from 9.0 °C to 17 °C ($m=13.1$ °C). Dissolved oxygen ranged from 2.69 to 9.2 mg/L ($m=4.46$ mg/L), and pH ranged from 7.5 to 8.5 ($m=7.7$). Egg masses at the north Ibapah monitoring site totaled 18. Egg masses were first recorded at north Ibapah on 2 April 2002, and the breeding season peaked that same week. Egg mass depth ranged from 0 cm to 10.0 cm ($m=2.6$ cm) and distance to shore ranged from 0.20 m to 3.0 m ($m=1.13$ m).

3.3.2 Snake Valley: Weekly monitoring began 5 March 2002 and continued until 16 April 2002. A total of 1867 egg masses were observed in this subunit (Table 3). Miller Springs contained a total of 1178 egg masses. Egg masses were first observed on 5 March 2002, and the season peaked the week of 27 March. Egg mass depth ranged from 0 cm to 10.0 cm, distance to shore ranged from 0 m to 7.0 m, and water temperature ranged from 2.0 °C to 25.3 °C (m=20.0 °C). Dissolved oxygen ranged from 1.50 to 5.37 mg/L (m=3.51 mg/L) and pH ranged from 7.5 to 8.0 (m=7.7). The Leland Harris monitoring site contained a total of 687 egg masses. Egg masses were first observed on 19 March 2002, and the season peaked the week of 23 March. Egg mass depth ranged from 0 cm to 8.0 cm (m=2.06 cm), distance to shore ranged from 0 m to 10.0 m (m=1.47m), and water temperature ranged from 6.2 °C to 23 °C (m=14.58 °C). Dissolved oxygen ranged from 1.11 to 12.34 mg/L (m=4.31 mg/L), and pH ranged from 7.0 to 8.0 (m=7.71).

3.3.3 Sweep surveys: Sweep surveys were conducted on April 4th, 11th, 12th, 19th, 25th, 26th, and May 22nd, 2002. Approximately 40 acres of potential habitat were surveyed. Sweep sites were selected using aerial photos when possible. USGS 7.5 minute quadrangle maps were also utilized, but are sometimes inaccurate as to current conditions. Drought effects were apparent in many areas, such as the Dixon Pond and Benjamin Slough sites. These two areas are mapped as large wetlands, and residual wetland vegetation was present (e.g. cattails), but both of these areas were almost completely dry. Sweep surveys conducted this year on the Provo River resulted in 32 additional sites located above Jordanelle Reservoir. Sweeps were also conducted in the Spanish Fork, Utah Lake, Tooele Valley, and San Pitch subunits (Figures 7 through 19). Selected sites near Holladay Springs, Benjamin, Salem Lakes, Dixon pond, Springville, Santaquin, Vernon and Atherly reservoir were surveyed in 2002, resulting in numerous amphibian sightings, and one new spotted frog location. A population of spotted frogs was discovered at Vernon on April 19, 2002. Four egg masses were found at the site. A voucher sample (3 eggs) was collected for genetic analysis, since spotted frogs have not previously been documented in this area.

4. DISCUSSION

Dry conditions continued for another year along the Wasatch Front and in the San Pitch area. The Provo River Subunit, which has a managed water system, has not been as negatively effected by the drought conditions. The sites in the West Desert had wetter conditions than those along the Wasatch Front, extending the breeding season over a longer period of time and providing generally favorable breeding conditions. We continued to flag and label egg mass locations in order to avoid recounting egg mass clusters that were already recorded in previous weeks. This method was first used in 2000 and is especially helpful at the larger sites in the West Desert.

In order to accurately assess annual fluctuations in egg masses observed, the amount of area covered within a monitoring site should be consistent. Therefore, comparisons in this report of the number of egg masses observed since monitoring began in 1992 (Tables 1 - 3) include the sweep data in parenthesis for the current and past survey years. This report does use total egg mass numbers (including sweep data) (Figures 1 - 6) to estimate total population sizes and their closeness to meeting the Conservation Agreement=s goals. Decisions will be made by the technical team in the future on whether to include spotted frog sites located during sweeps with original monitoring sites that are used to evaluate annual fluctuations in spotted frog numbers and determine how close populations are to meeting the Conservation Agreement=s goals.

Additionally, it is important to consider other factors that may result in a natural decrease in egg mass numbers. Drought conditions over the past several years may have reduced the amount of breeding habitat, as well as other resources available to adult frogs during the summer and fall, perhaps leading to reduced egg formation in pre-hibernating females. This may account for the decreased number of egg masses in several of the GMU=s. It is likely that when conditions are unfavorable, adult frogs may forgo breeding (Twitty 1966; Semlitsch et al. 1996). Therefore, a reduction in egg mass numbers does not necessarily equate to a decrease in the adult frog population at any given site.

4.1 Wasatch Front GMU

4.1.1 Spanish Fork River. The number of egg masses observed at the Springville East Pond continued to decrease, going from 25 in 2001 down to 9 in 2002 (Table 1 & Figure 1). The number of egg masses observed at Holladay Springs also decreased again in 2002, dropping from 52 in 2001, to 27 in 2002 (Table 1 & Figure 1). Conditions at Holladay Springs were very

dry, with little excess irrigation water coming onto the site. There was no water in the cattail area adjacent to the main pond, or in the small pond to the south (sweep site). While both spotted frog populations within this subunit fail to meet the Conservation Agreement's goal of an effective population size of 1000 individuals, they do meet the requirement of an effective population size of 50 individuals (Table 1).

Sweep surveys were conducted at the following locations in 2002, totaling approximately 12.6 acres:

(West Mountain Quad)

Water levels were extremely low in the Holladay springs area. A wetland site adjacent to I-15, southeast of the Holladay Springs monitoring site was checked, but had insufficient water for spotted frog breeding this year (**R2E, T9S, S30**). Two large ponds and associated wetlands north of Holladay Springs were also surveyed. Although water was plentiful, the large ponds appeared to have fish (carp?), lacked structure, and had very steep banks. The wetland running along the channel had nice cattails and sufficient water levels in several spots, but no amphibians were detected. The homeowner stated that they hear frogs during the summer. The channel continues north, under the road and into Tanner Reservoir, which was not surveyed due to lack of access (could not locate property owner) (**R1E, T9S, S12**) (Figure 7). The Benjamin Slough area had some standing water, but was largely dry. According to one landowner, the BLM owns some of this land, but access points are not marked and many of the roadside gates were padlocked. A landowner did allow access to a portion of this site (north of the Beer Creek channel), but this area was very dry, with only a shallow channel still holding water of very poor quality (**R1E, T9S, S24**) (Figure 8).

(Spanish Fork Quad)

Ponds adjacent to the railroad, across the street from the Benjamin cemetery, were surveyed (Beer Creek appeared to be the primary water source via a concrete water structure). A dead tadpole (unknown species) was retrieved from the pond, and chorus frogs could be heard in the area. Water levels were good, although deep, muddy substrate made it difficult to venture into the ponds (**R2E, T8S, S33**). Wetland sites in the Dixon pond area were very dry, as standing cattails were present in areas without any water, and those areas that were wet did not appear to have any flow (water looked very stagnant). Dixon pond was inaccessible (posted and gated),

but did have some water. There were no houses in the immediate area, so ownership would have to be located using plat maps. The wetland north of Dixon pond was observed from the road, but appeared very dry. Grimes pond, east of the Dixon pond, was dry also (**R2E, T8S, S's 2&3**). A small wetland north of the Dixon Pond area (at the road corner separating Sections 26 and 35 on "Beet" road), was also dry (**R2E, T8S,S35**). The Salem Lake ponds are impacted by excessive human use, and lacked any bank or emergent vegetation. Dredging was occurring adjacent to the lower pond, and water flow out of the ponds (to the northwest) was very minimal. (**R2E, T9S, S11**). The "frog farm" ponds to the west of Salem Lake were also surveyed. The resident in the rental house accompanied us to the ponds, and stated that he has seen "bright green frogs with a thin waist" in the ponds and canals on the property. There were large fish (carp or catfish) in the ponds, as well as small minnows, but no frogs were seen. Ducks, geese and sandhill cranes were present on the ponds, water quality in the ponds was very turbid, although the adjacent channels appeared much clearer. The renter also stated that they hear frogs in the defunct water recycling/treatment pond (located adjacent to the barns). There is a seeping springhead at that pond, but the water had a thick layer of algae, and was only accumulating at the north end (appeared to be about a foot deep in places). This site could have green frogs (from the previous frog hatchery), as well as chorus frogs (**R2E, T9S, S10**) (Figure 9). Two areas were surveyed near Spring Lake. The wetlands adjacent to the lake, on the east side of the dike, were partially surveyed. Leopard frog eggs were located on the west bank, adjacent to the dirt road (parking/picnic site). There is a fenceline that runs through the wetland, and the adjacent property is privately owned by two private landowners (one on the north, one on the south). We did not seek permission to survey the entire area, due to time constraints, but most of the open water appeared to be near the lake dike, which we were able to access. A local landowner spoke with us at this site, stating that he had known of bullfrogs at this location, but had not heard or seen them for several years (he lives across the street from the lake). He has a small wetland behind his house (address 3977 on 12400 S. Street), which he allowed us to survey, but it was not holding any water due to the dry conditions. He stated that his grandkids have found tadpoles there previously. It appears to be fed from a feeder stream coming out of Spring Creek (**R2E, T9S, S29**) (Figure 10).

(Springville Quad)

A pond located behind Springville High School (shown as the old race track on the quad map) was surveyed. Water appeared to be coming in from an adjacent drainage, but there may also be a spring on site. The area consisted of a large pond and associated wetlands along the community park walking path. No amphibians were observed, and it could not be determined if there were fish present in the pond, but it was adequately large to accommodate fish

(R 3E, T7&8S, S's 34&3). Springs adjacent to the high school (across the street to the southeast) appeared to be mostly dry (possibly capped). Springs labeled Konold and Osler **(Section 2)** to the east of the high school were no longer visible (either capped or contained in someone's backyard). Burt Spring Pond was surveyed; the landowner says that they don't see frogs much anymore, although they used to have bull frogs and green frogs about 15 years ago. He has large trout in the main pond; the adjacent channel had some emergent willows, but did not look promising for amphibians due to the development on site. Small ponds along Hobble Creek, on 2900 East Street (east of Burt Spring), were surveyed, but no amphibians were detected **(R3E, T8S, S1)**. A small pond remains in the commercially developed area to the west of T-Bone bottoms (next to LKQ Auto shop). This site was surveyed, but water quality looked very poor, probably due to runoff from the road **(R3E, T8S, S8)** and no amphibians were found (Figure 11).

Utah Lake. The number of egg masses observed at monitoring sites within Mona Springs and Burraston Ponds decreased from 69 in 2001 to 41 in 2002 (Table 1 & Figure 2). This area was generally dry in areas that were not being irrigated, although some water was present at both of the monitoring sites south of Burraston. Water levels at Mona Springs were very low until the irrigation system was engaged, but water levels did not increase until after the breeding season had ended. The Utah Lake spotted frog population, currently estimated to be 82 adults, has failed to meet the Conservation Agreement's goal of 1000 individuals.

Sweep surveys were conducted at the following locations in 2002, totaling approximately 8 acres:

(Santaquin Quad)

A large detention pond at the terminus of Summit Creek was visited, but was completely dry **(R1E, T10S, S12)**. A spring at the base of the mountains directly east of Santaquin has

apparently been capped, and a water storage tank is located on that site (**R2E, T10S, S6**) (Figure 13).

(Mona Quad)

Wetlands adjacent to the Mona monitoring site were surveyed (west of electric fence), but no amphibians were detected. A springfed pond on the north end of the town of Mona (adjacent to the state Highway) was also surveyed, but no amphibians were detected (**R1E, T11S, S31**) (Figure 14)

Provo River: Although the Provo River system is a managed water system, some drought effects may still be present, as well as effects from fluctuating water levels. Spotted frog egg mass numbers were generally declining since 1997, but have increased in 2002. The spotted frog population below Jordanelle, estimated to be 1100 adults (Table 1 & Figure 3), meets the Conservation Agreement=s goal of 1000 individuals.

The number of egg masses observed at monitoring sites above Jordanelle Reservoir increased from 31 in 2001 to 44 in 2002. There was also a significant increase in the population estimate due to the egg masses found in sweep locations. The spotted frog population above Jordanelle, including sweep sites, is estimated to be 520 adults (Table 1 & Figure 3), exceeding the Conservation Agreement=s goal of 50 individuals.

(Billies Mountain Quad)

The recent discovery of a new Wasatch front population of spotted frogs along lower Diamond Fork River was good news for the recovery team and the species. Beginning spring 2003, the new site will be incorporated into annual monitoring and a sweep of the adjacent area will be conducted as well.

4.1.2 Sevier River GMU

San Pitch River. Surveys in 2002 reflected a decrease in spotted frog numbers at both monitoring and sweep sites. It should be noted that access was denied to monitoring sites 1,2 and 3, and that site 11 was dry again this year. There were also several sweep sites that were dry, or that had very low water levels. The current population estimate is approximately 172 adults (Table 2 & Figure 4). Efforts are underway to develop conservation easements with several property owners in the San Pitch valley. These efforts may result in habitat

improvements and protection, as well as encouraging other property owners to cooperate with management activities for the spotted frog within the San Pitch valley. The San Pitch spotted frog population, currently estimated to be 172 adults, has failed to meet the Conservation Agreement's goal of 1000 individuals.

Sweep surveys were conducted at the following locations in 2002, totaling approximately 8 acres:

(Moroni Quad)

The pond that had leopard frog eggs in 2001 was revisited again, and leopard frog egg masses were observed, but no other amphibians were detected (although chorus frogs are likely in this area) (**R3E, T15S, S13**). Leopard frog eggs were also located in a pond owned by Peter Hafen, which also contains large trout (although the fish are no longer being stocked in this pond). Three roadside ponds, just east of Mr. Hafen's, owned by Leo Gillespie, look like good habitat, but were not surveyed due to lack of access (could not find caretaker) (**R4E, T15S, S6**). A large pond owned by Mr. Brotherson (owner of one of the Fairview frog sites) was also surveyed, although a neighbor said that it is only filled for irrigation use, and otherwise is empty (although it appeared to be springfed). No amphibians were detected there (**R4E, T15S, S7**). A pond on the property of Mark Johansen (does not show a pond on the quad map) was also surveyed, but was more or less a shallow, mud flat, with no vegetation. There were several springs on site, but the springheads were silted in, and the water was basically just flowing out of the area without really forming ponds (Figure 15). The area south of Wales Reservoir contained several channels and associated ponds. Chorus frogs were heard, and some other larger frogs were seen jumping into one of the channels, but could not be identified (**Section 20**) (Figure 16).

(Wales Quad)

Two ponds south of the town of Wales were surveyed. One was completely dry. The other could not be accessed, as the homeowner was not there, and the gate was locked. Most of the ponds in this area were completely dry (**R2E, T15S, S's 30&31**) (Figure 17).

(Mt. Pleasant Quad)

One pond, shown on the map southeast of town, was no longer there (**R4E, T15S, S11**). Another nearby pond, adjacent to Twin Creek, had extremely low water, and no amphibians were detected (**R4E, T15S, S11**) (Figure 18).

4.1.3 West Desert GMU

Ibapah Valley. The number of egg masses observed at monitoring sites decreased from 386 in 2001 to 201 in 2002 (Table 3 & Figure 5). The number of egg masses observed at the north Ibapah monitoring site decreased from 73 in 2001 to 18 in 2002. This site fluctuates widely in egg mass number, possibly due to the seasonal and temporary nature of the water on this site. Water levels were adequate in 2002, but as in 2001, no frogs were seen or heard at the site.

The number of egg masses observed at the south Ibapah Valley monitoring site also decreased from 314 in 2001 to 183 in 2002. Impacts from cattle at south Ibapah continue to be apparent, with no apparent regrowth of rushes or cattails since last year, and several dead cows in the springheads. The Ibapah Valley spotted frog population, currently estimated to be 402 adults, has failed to meet the Conservation Agreement=s goal of 1000 individuals.

Snake Valley. 1998 was the first year of monitoring newly designated monitoring sites. The number of egg masses observed at monitoring sites dropped slightly this year, decreasing from 1,956 for 2001, to 1,865 in 2002 (Table 3 & Figure 6).

In 2000, a cooperative agreement was formed between the UDWR, USFWS, and the owner of Miller Springs, to better protect spotted frog by managing cattle use of the spring complex. With a spotted frog population currently estimated to be 3730 adult frogs, the Snake Valley population exceeds the Conservation Agreement=s goal of 1000 individuals.

Tooele Valley

Sweep surveys were conducted at the following locations in 2002, totaling approximately 9.5 acres:

(Vernon Quad)

A wetland in the town of Vernon, located on the Vernon Beef Project Church farm (corner of Sharp and Harker roads), was surveyed, and four spotted frog egg masses were found. The wetland contains abundant emergent vegetation, and is not currently grazed by cattle. There

appears to be water coming from an upslope spring to the east, draining into the lower wetland area, which may also have a spring. There is also water coming down a channel from the south. Water levels were good on site, although water leaving the site ran into a culvert and appeared to flow under the road and into roadside ditches – no other emergent wetlands were visible in the immediate area. The main house east of the farm is where the caretaker lives (Mr. Albertson). Three eggs were taken for a voucher specimen. A pond next to the channel at the neighbor's house (Mr. Yates) was also surveyed, but the pond lacked structure and appeared to have either carp or coy in it (**R5W, T8S, S31**). We returned to the church farm wetland on May 22nd and were able to locate several tadpoles. Water levels were still good at that time. Several springs to the southwest of the church farm were also surveyed on May 22nd, but no amphibians were seen. This site had several spring ponds, located adjacent to a large grove of willows, and also had irrigation water flowing through the site. Due to the late date of this initial survey, and the proximity to the church farm site, these ponds should be revisited during the breeding season if possible, to better determine presence of amphibians (**R6W, T8S, S36**) (Figure 19).

(Sable Mountain Quad)

Vernon Reservoir (near Benmore) was surveyed, but no suitable habitat was present on site. The reservoir is highly impacted by camping/recreational use, and is stocked with fish. There was very little vegetation surrounding the reservoir, possibly due to fluctuating water levels (**R5W, T10S, S11**).

(Faust Quad)

The Atherly Reservoir area was surveyed, including portions of the main ponds, surrounding wetlands and feeder channels. The large ponds are not very suitable for amphibians, as most “banks” are made from large cobble, although some banks do have a silt deposits and some grassy vegetation. The head of the channel (north of the main reservoir) appears to have either a small spring, or subsurface leakage from the reservoir. This area has some small ponds and wetlands, but no amphibians were detected (**R5W, T7S, S 28**). The small stock pond across the street to the south (**Section 29**) is completely degraded by livestock. An extensive wet meadow occurs to the southwest of Atherly Reservoir. This area is normally flooded via a network of ditches and drainages on site, but when surveyed on May 22nd, there was no water outside of a few of the irrigation channels. It is unknown whether this area is normally wetter

than was observed, but no amphibians were seen. There was very little ponded water on the site, which would severely limit breeding in this location. (**R5W, T8S, S6**) (Figure 20).

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- Wilson, K.W., C.K. Balcombe. 2001. Columbia Spotted Frog (*Rana luteiventris*) Habitat Management Plan, San Pitch Subunit. Utah Division of Wildlife Resources. Springville, Utah.

Table 1: Number of egg masses observed within the Wasatch Front GMU

Subunit	Population	Number of Egg Masses										2002 Population Estimate	Goal
		1992	1994	1995	1996	1997	1998	1999	2000	2001	2002		
Spanish Fork River	Springville	12	7	6	0	65*	87	44	50	25	9	18	1000 or 50
	Holladay Springs	36	24	33	29	64	122	144 (192)	135 (160)	52 (68)	27 (27)	54	1000 or 50
Utah Lake	Mona/ Burraston	15	5	66	63	148	78	61 (78)	111 (120)	69 (73)	33 (33)	66	1000
Provo River	Heber Valley	272	120*	156* (167)	323* (473)	219* (491)	176* (372)	206* (438)	151 (431)	123 (418)	206 (550)	1100	1000
	Jordanelle/ Francis	63	92	79	29	21	21	20 (63)	59 (99)	31 (165)	44 (260)	88 or 520**	50

* First year Springville Hatchery pond was included in the totals.

** Larger number is population estimate based on all egg masses observed.

H Corrected number

1992 Survey--Ross et al. 1994-2002 Surveys--CRO data files

* corrected numbers

() total egg masses for that year including sweep data

Table 2: Number of egg masses observed within the Sevier River GMU

Subunit	Population	Number of Egg Masses										2002 Population Estimate	Goal
		1992	1994	1995	1996	1997	1998	1999	2000	2001	2002		
San Pitch River	Fairview	54	35	34	24	24	22	17 (25)	59 (137)	20 (153)	8 (86)	16 or 172*	1000

* Larger number is population estimate based on all egg masses observed

1992 survey--Ross et al.

1994-2002 surveys--CRO data files

() total egg masses for that year including sweep data

Table 3: Number of egg masses observed within the West Desert GMU

Subunit	Population	Number of Egg Masses										2002 Population estimate	Goal
		1993	1994	1995	1996	1997	1998	1999	2000	2001	2002		
Ibapah Valley	Ibapah Valley	2195	X	X	X	735 (2321)	440*	621	327	387	201	402	1000
Snake Valley	Miller/Leland Harris	739	X	847	1291	910	2154	2066	1887	1956	1865	3730	1000

* Changes occurred in the area included in the monitoring sites (size of area was reduced).

X = Not surveyed

1993 Survey--Ross et al.

1995-2002 Surveys--CRO data files

() total egg masses for that year including sweep data

Figure 1. **Number of egg masses observed (including sweep data) in the Spanish Fork River subunit, 1992-2002**

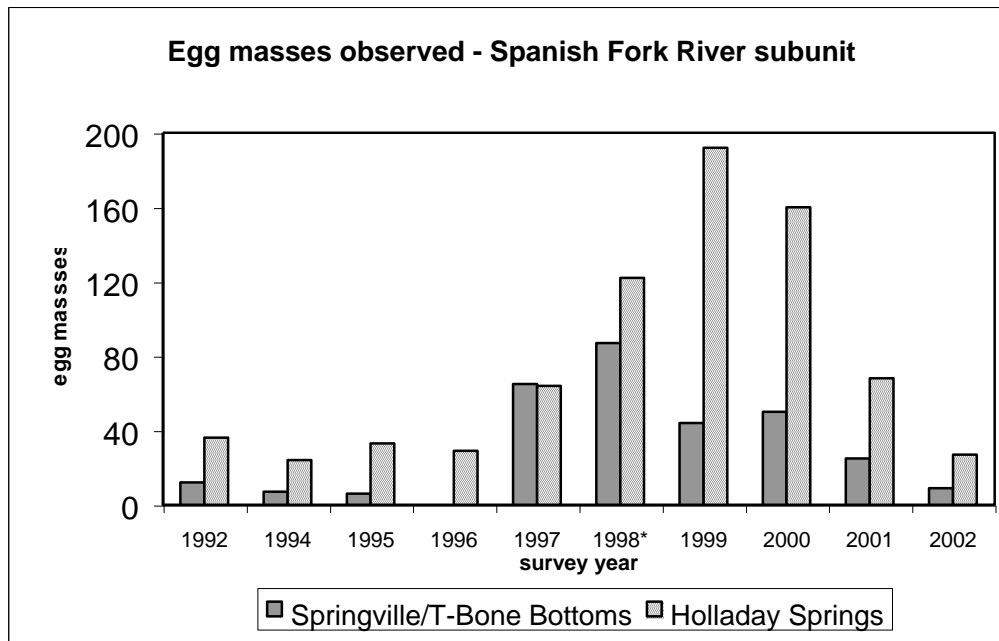


Figure 2. **Number of egg masses observed (including sweep data) in the Utah Lake subunit, 1992-2002.**

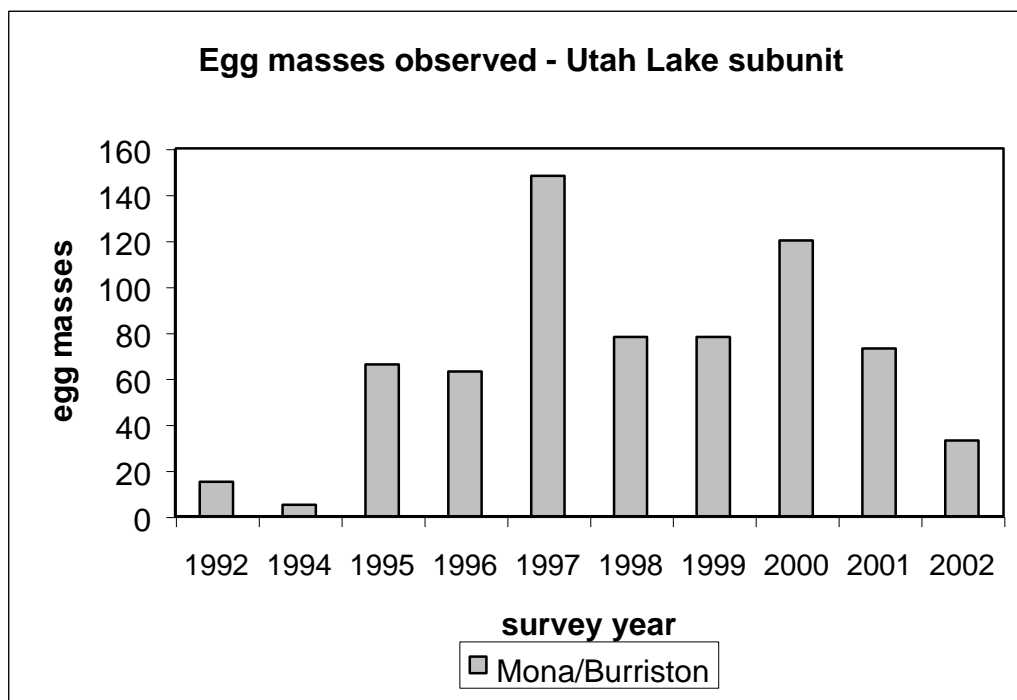


Figure 3. Number of egg masses observed (including sweep data) in the Provo River subunit, 1992-2002.

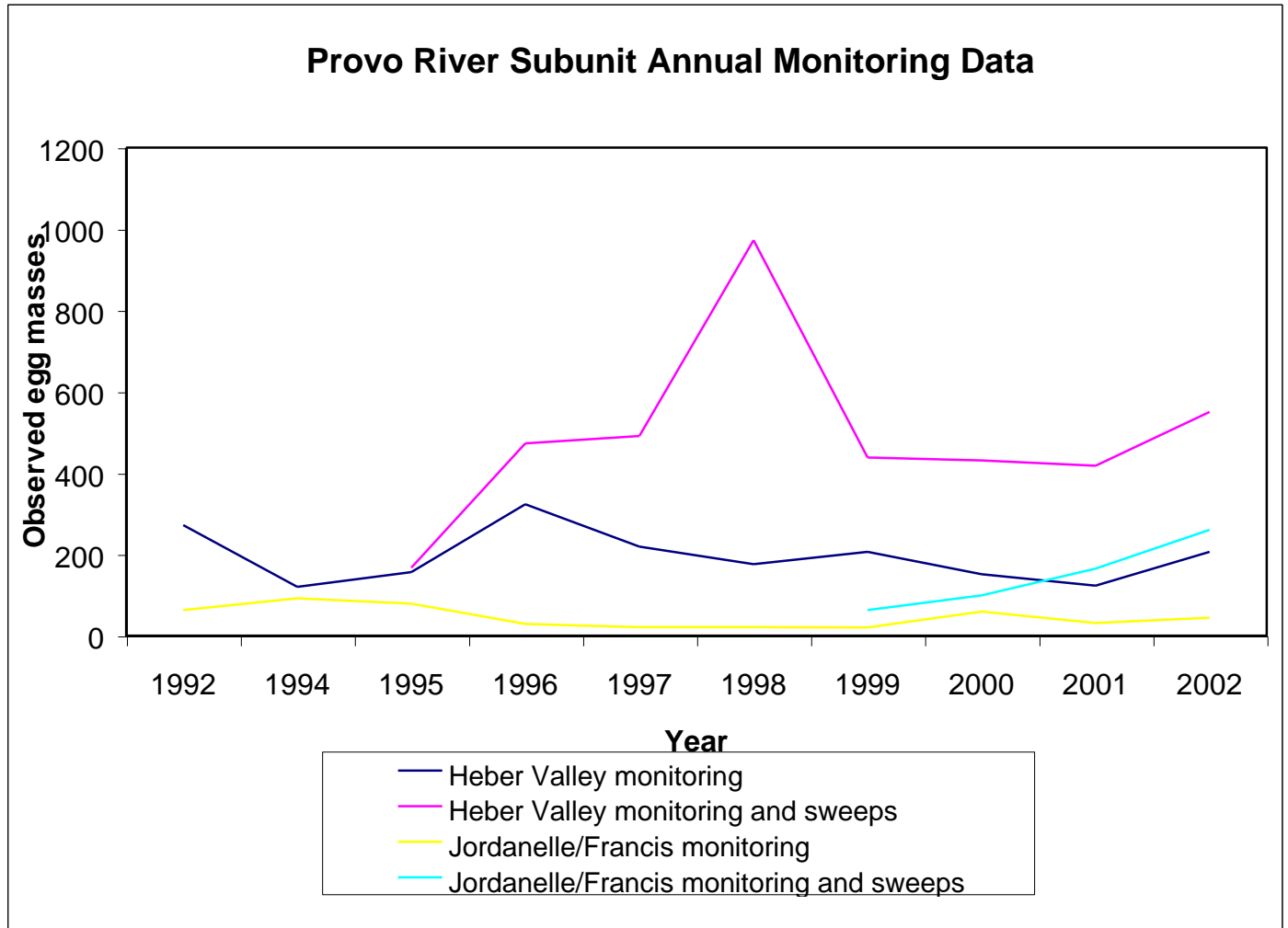


Figure 4. Number of egg masses observed (including sweep data) in the San Pitch subunit, 1992-2002.

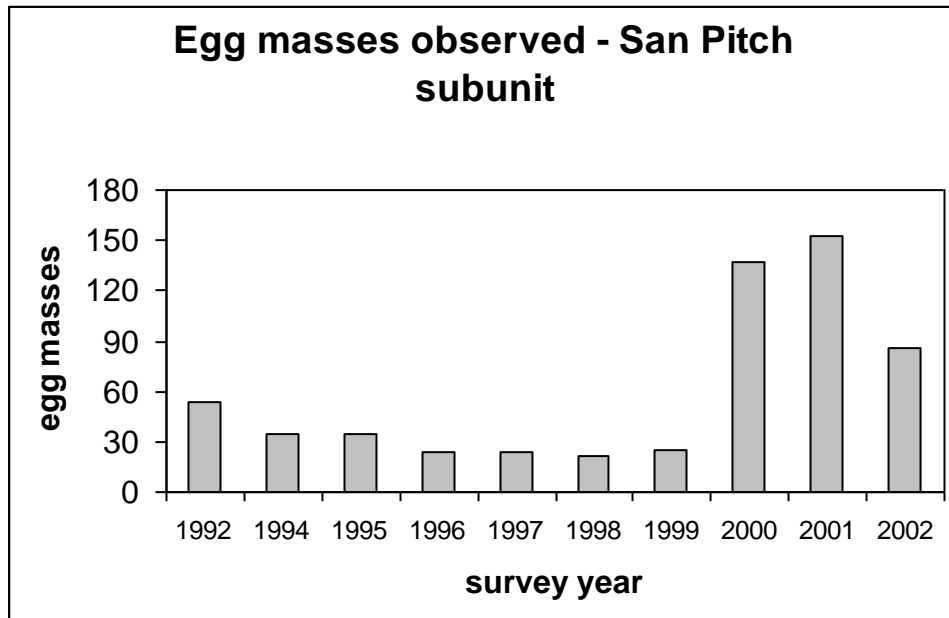
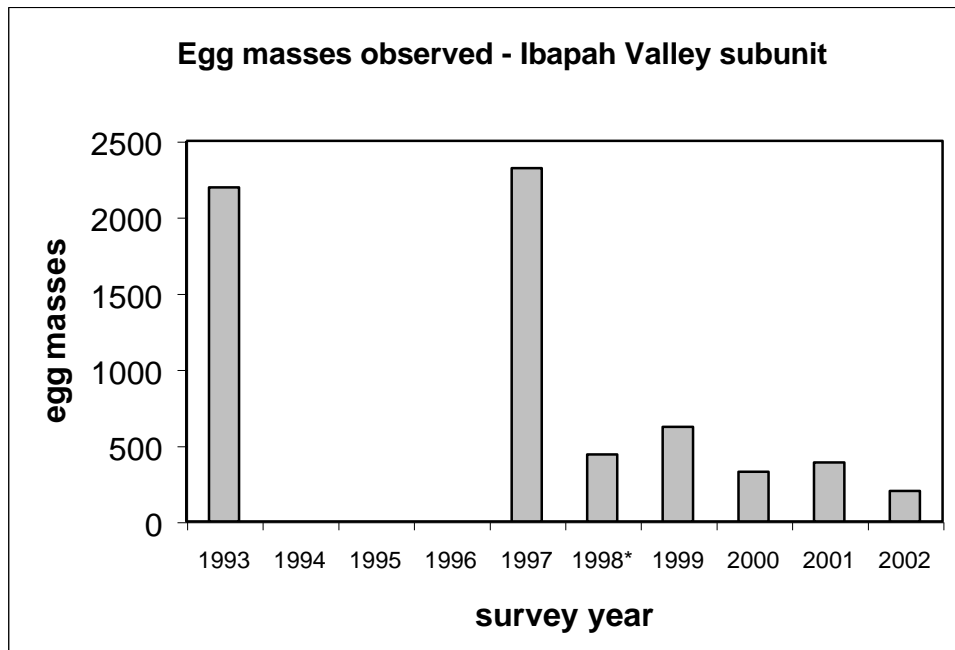
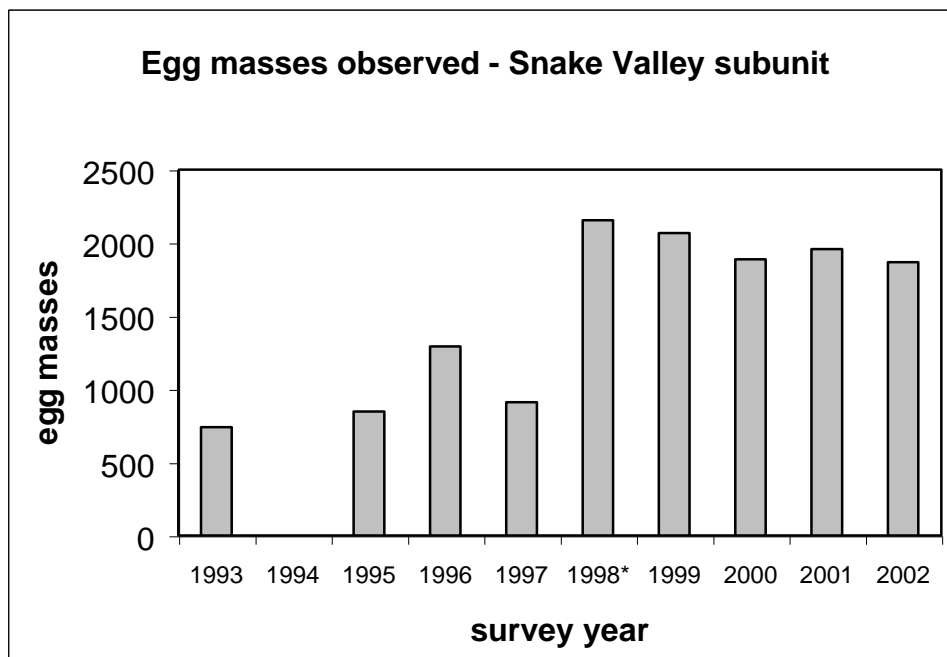


Figure 5. Number of egg masses observed in the Ibapah Valley subunit, 1993-2002.



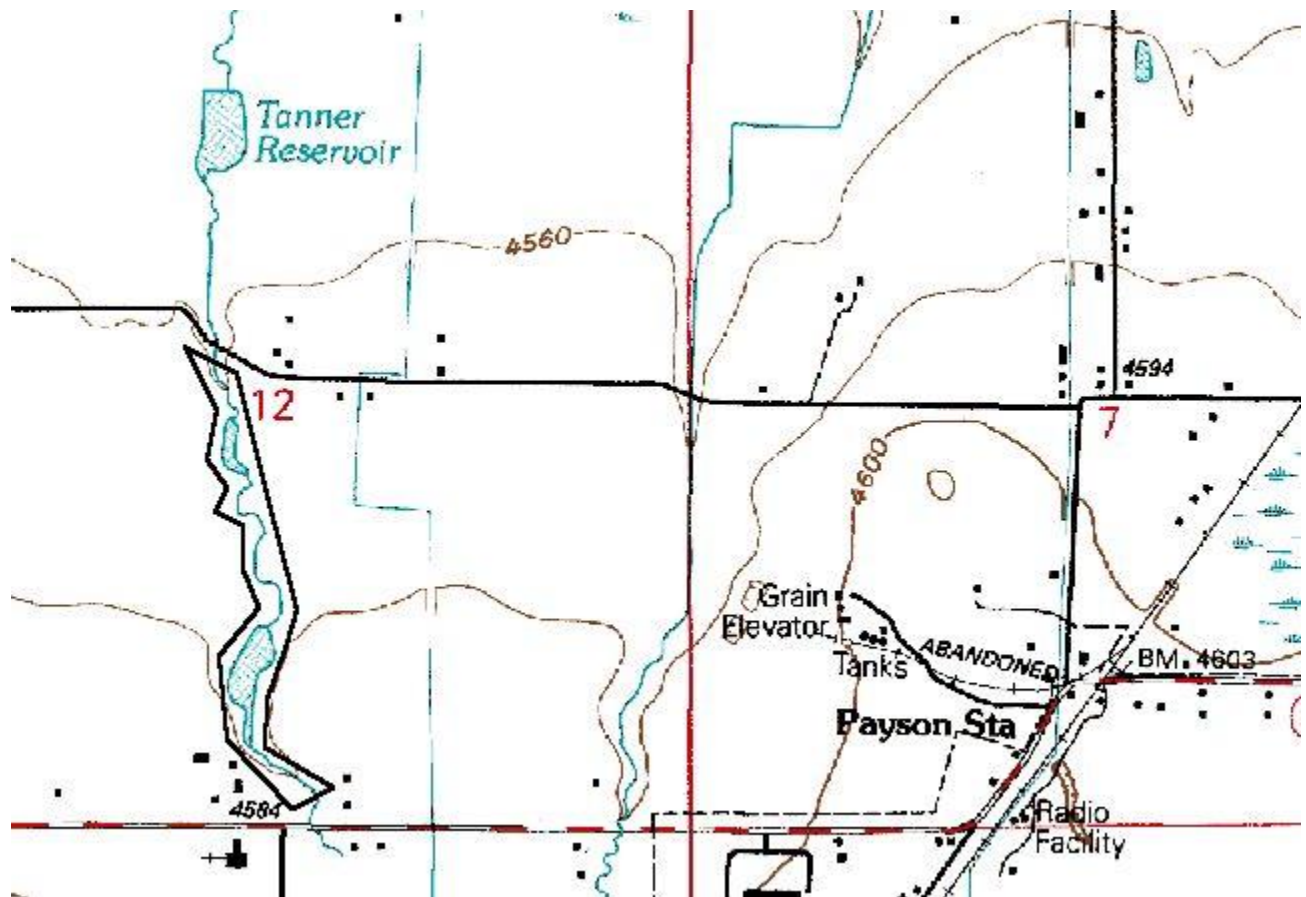
* First year of monitoring designated monitoring sites

Figure 6. Number of egg masses observed in the Snake Valley subunit, 1993-2002.



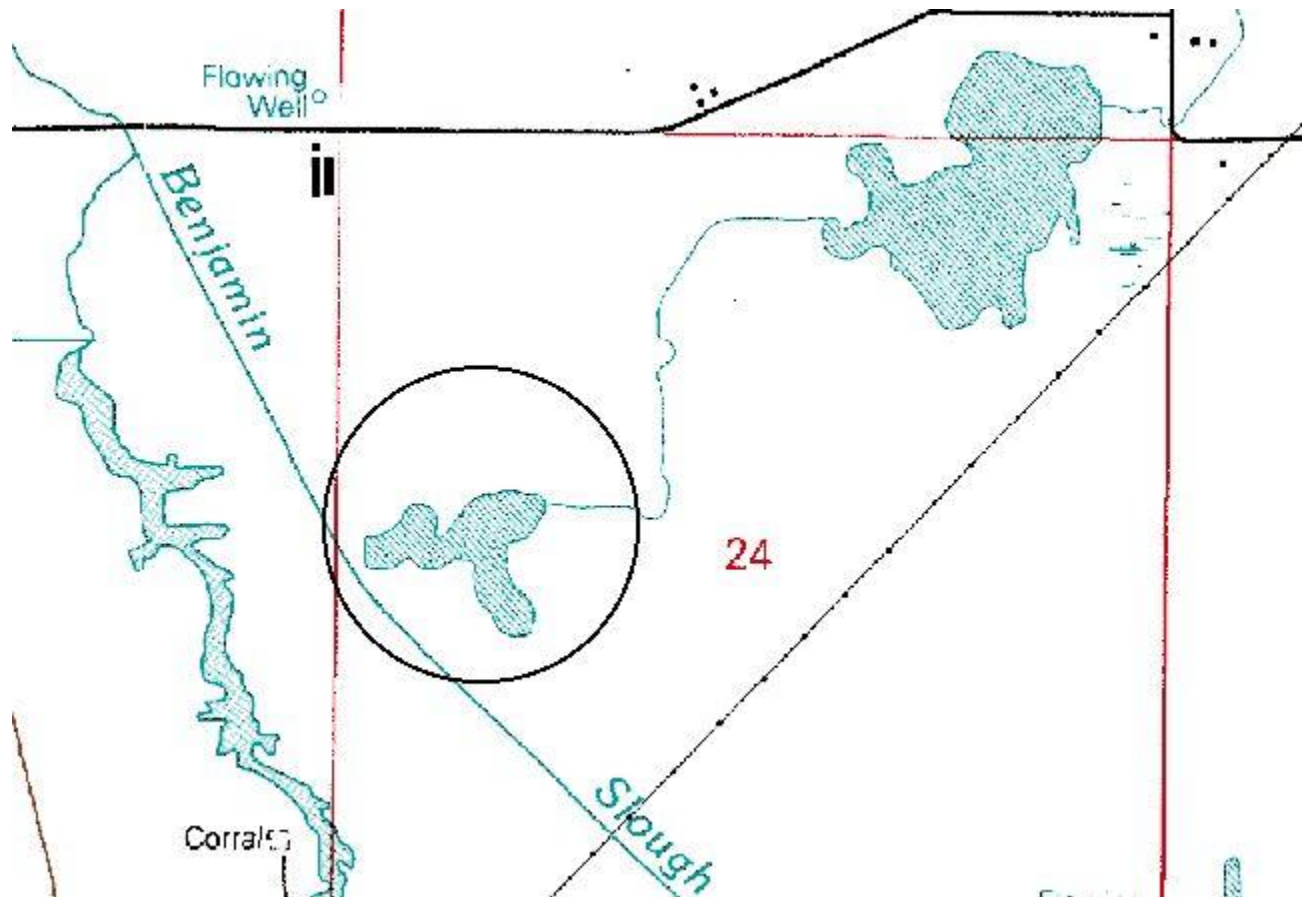
* Changes occurred in the area included in the monitoring sites.

Figure 7. 2002 sweep locations in the Spanish Fork River subunit. Survey sites were located using 7.5 minute quadrangle (topographic) maps. Survey areas are outlined.



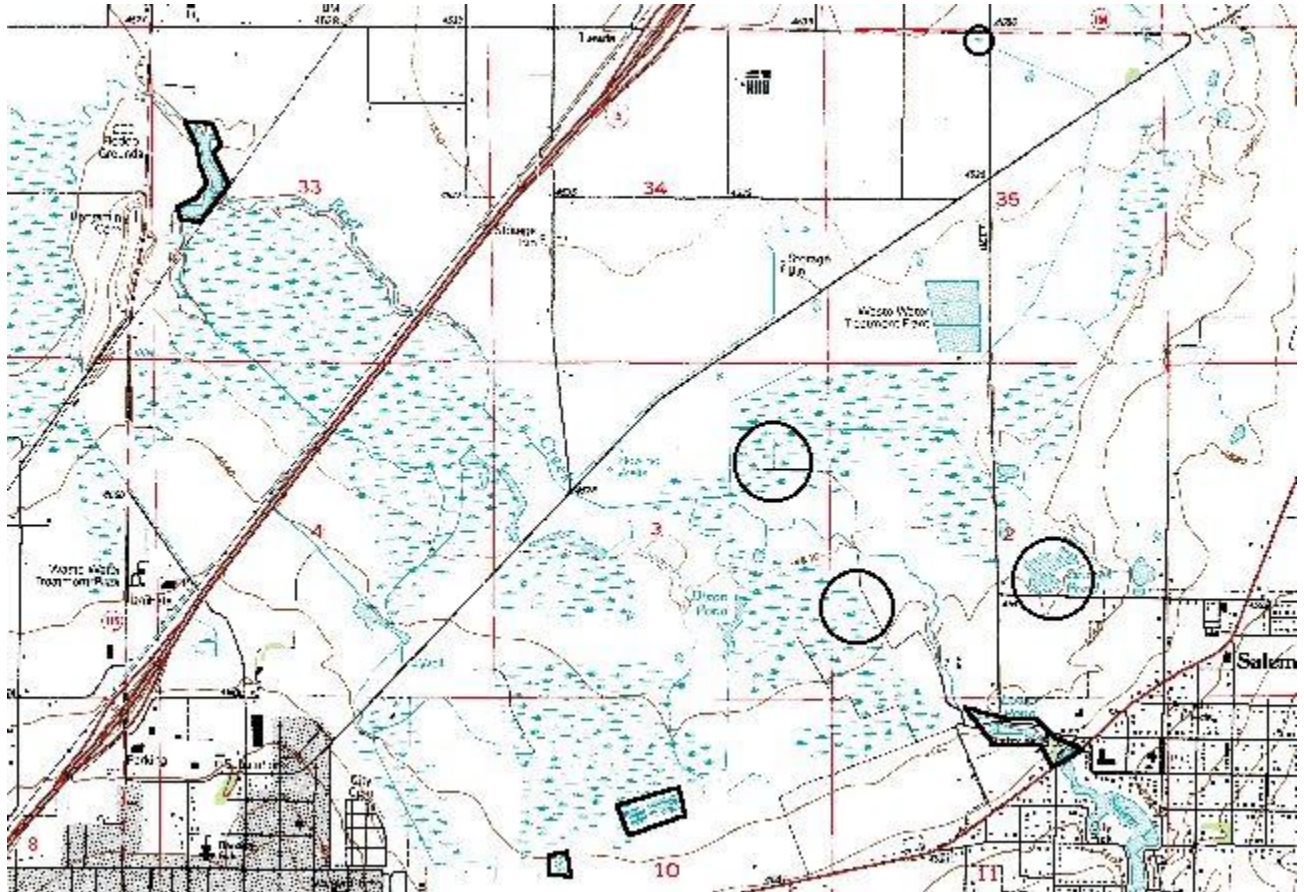
West Mountain quadrangle map, north of Holladay Springs.

Figure 8 2002 sweep locations in the Spanish Fork River subunit. Survey sites were located using 7.5 minute quadrangle (topographic) maps. Survey areas are outlined.



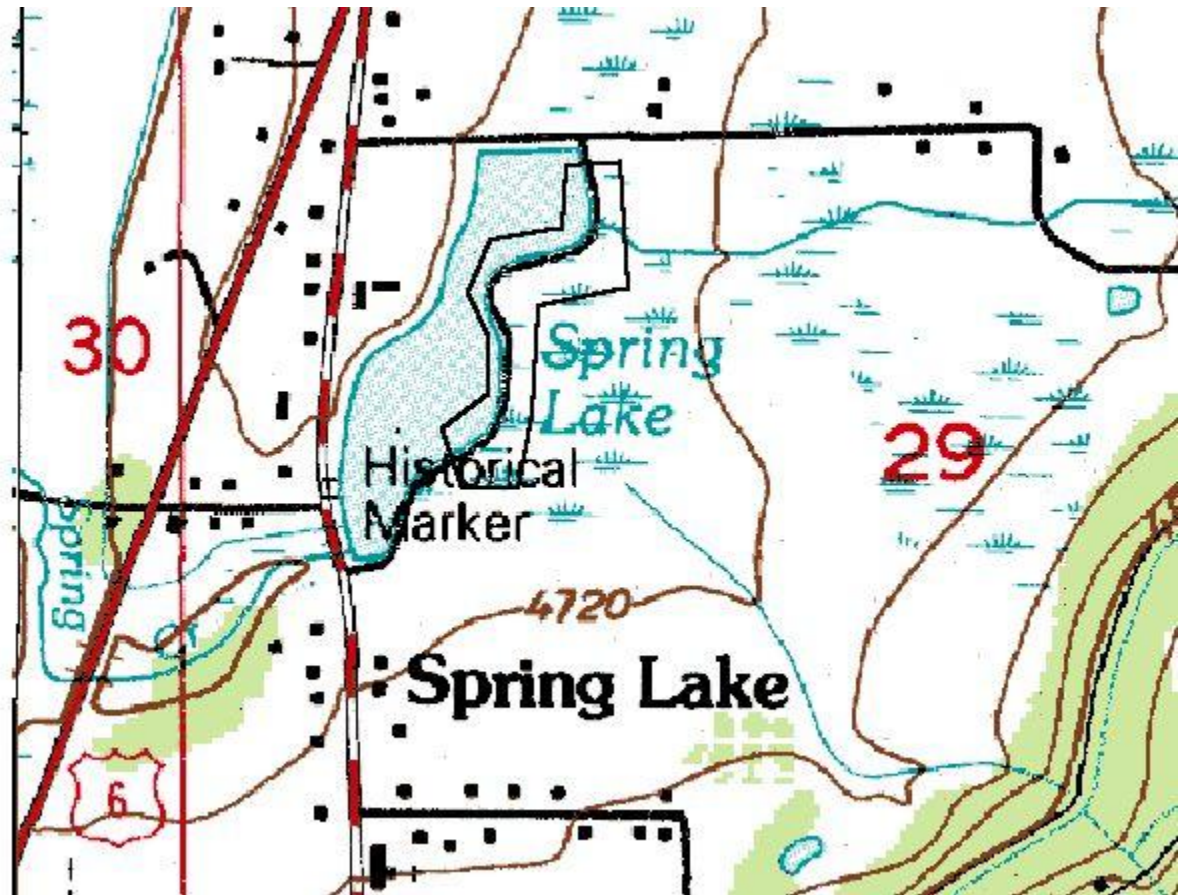
West Mountain quadrangle map

Figure 9. 2002 sweep locations in the Spanish Fork River subunit. Survey sites were located using 7.5 minute quadrangle (topographic) maps. Survey areas are outlined.



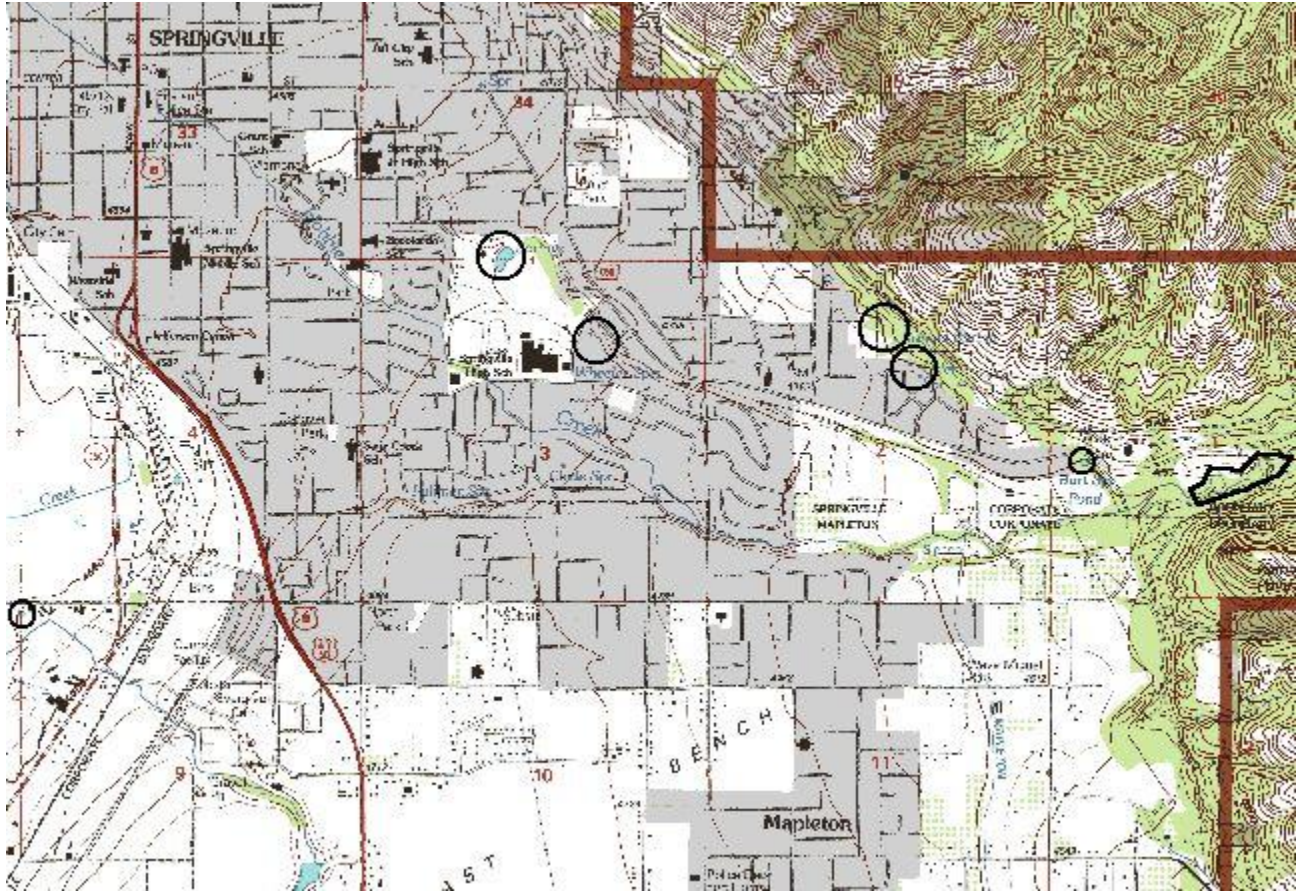
Spanish Fork quadrangle map

Figure 10. 2002 sweep locations in the Spanish Fork River subunit. Survey sites were located using 7.5 minute quadrangle (topographic) maps. Survey areas are outlined.



Spanish Fork quadrangle map

Figure 11. 2002 sweep locations in the Spanish Fork River subunit. Survey sites were located using 7.5 minute quadrangle (topographic) maps. Survey areas are outlined.

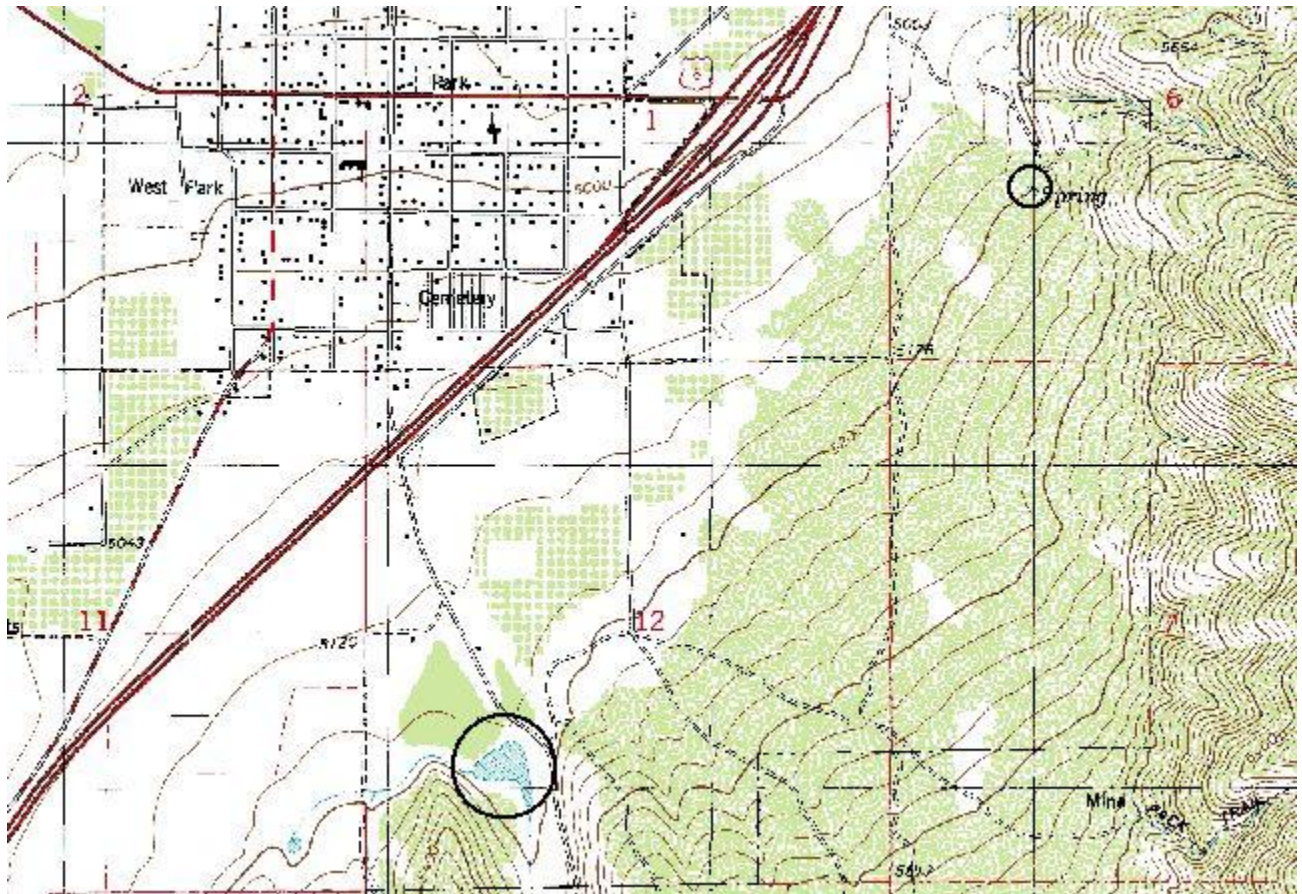


Springville quadrangle map

Figure 12 Location of the new spotted frog population in Diamond Fork Canyon

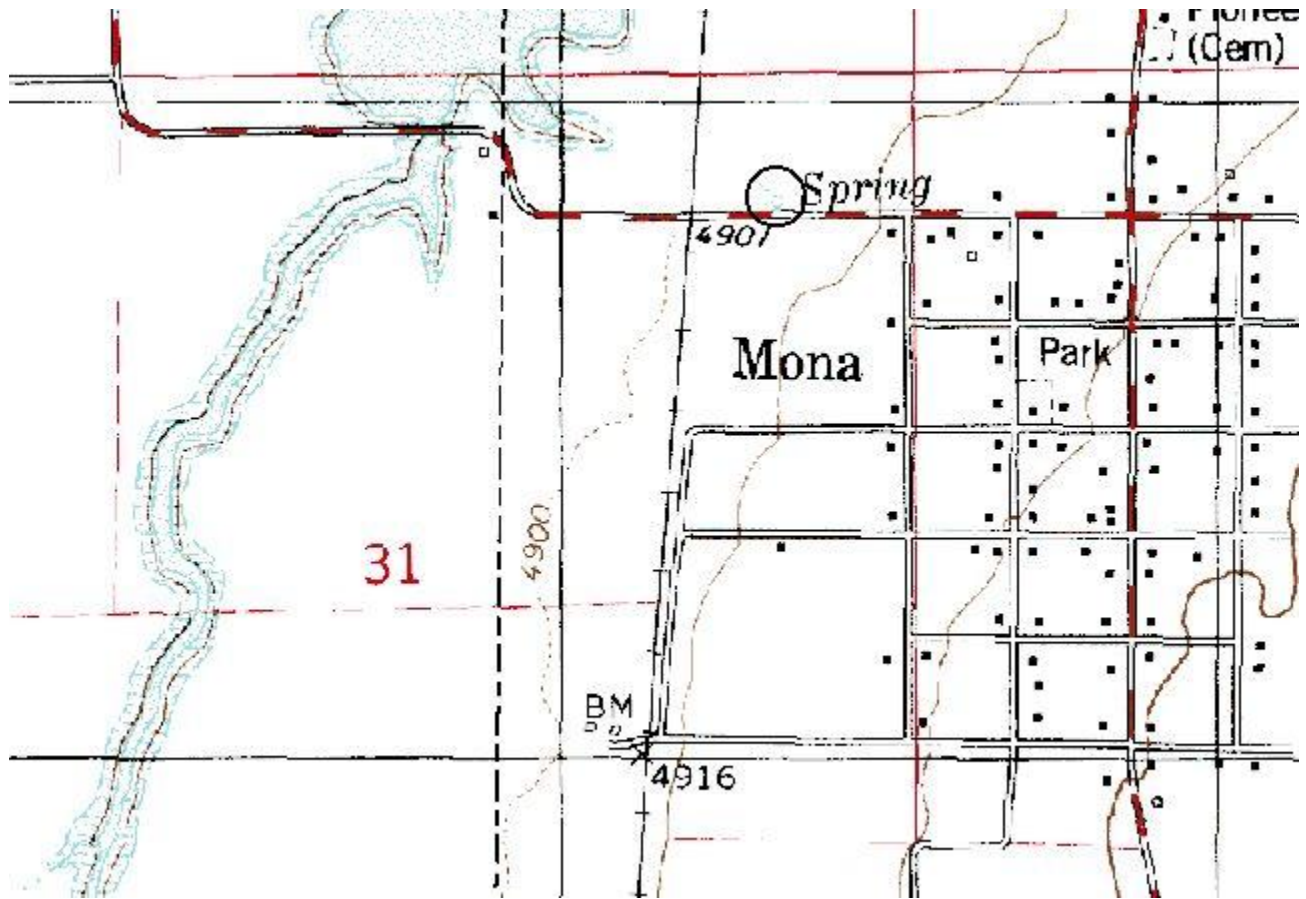


Figure 13. 2002 sweep locations in the Utah Lake subunit. Survey sites were located using 7.5 minute quadrangle (topographic) maps and aerial photos. Survey areas are outlined.



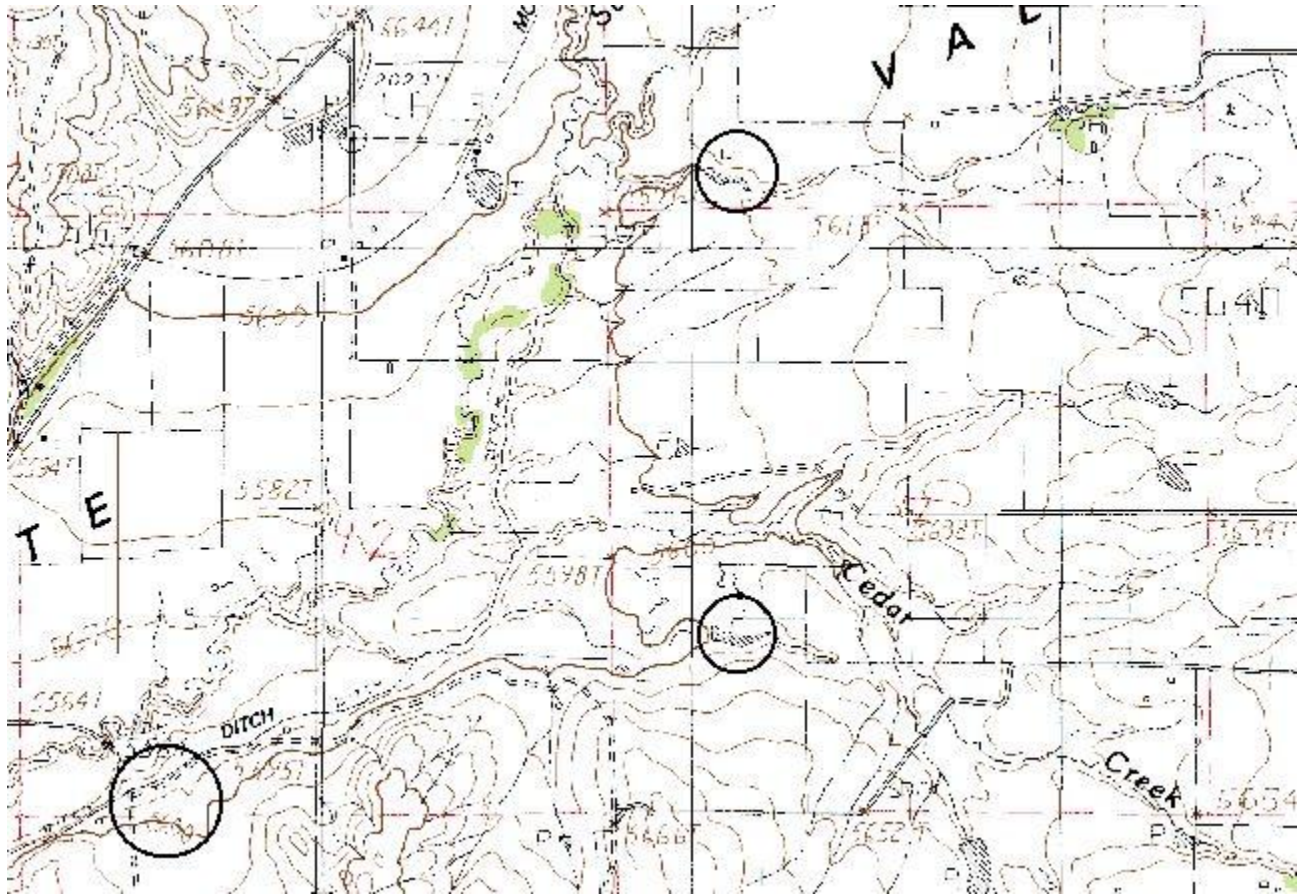
Santaquin quadrangle map.

Figure 14. 2002 sweep locations in the Utah Lake subunit. Survey sites were located using 7.5 minute quadrangle (topographic) maps and aerial photos. Survey areas are outlined.



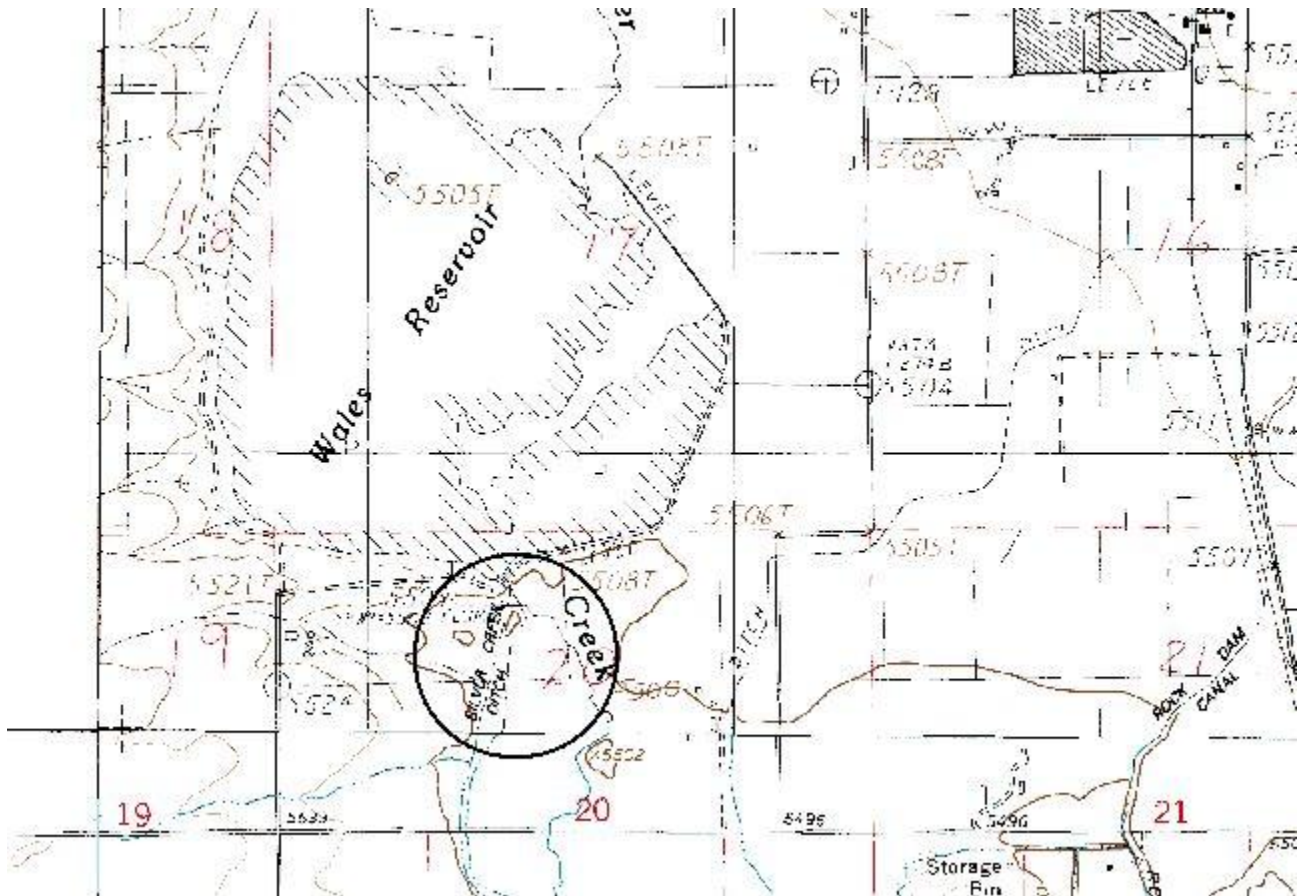
Mona quadrangle map.

Figure 15. 2002 sweep locations in San Pitch subunit. Survey sites were located using 7.5 minute quadrangle (topographic) maps. Survey areas are outlined.



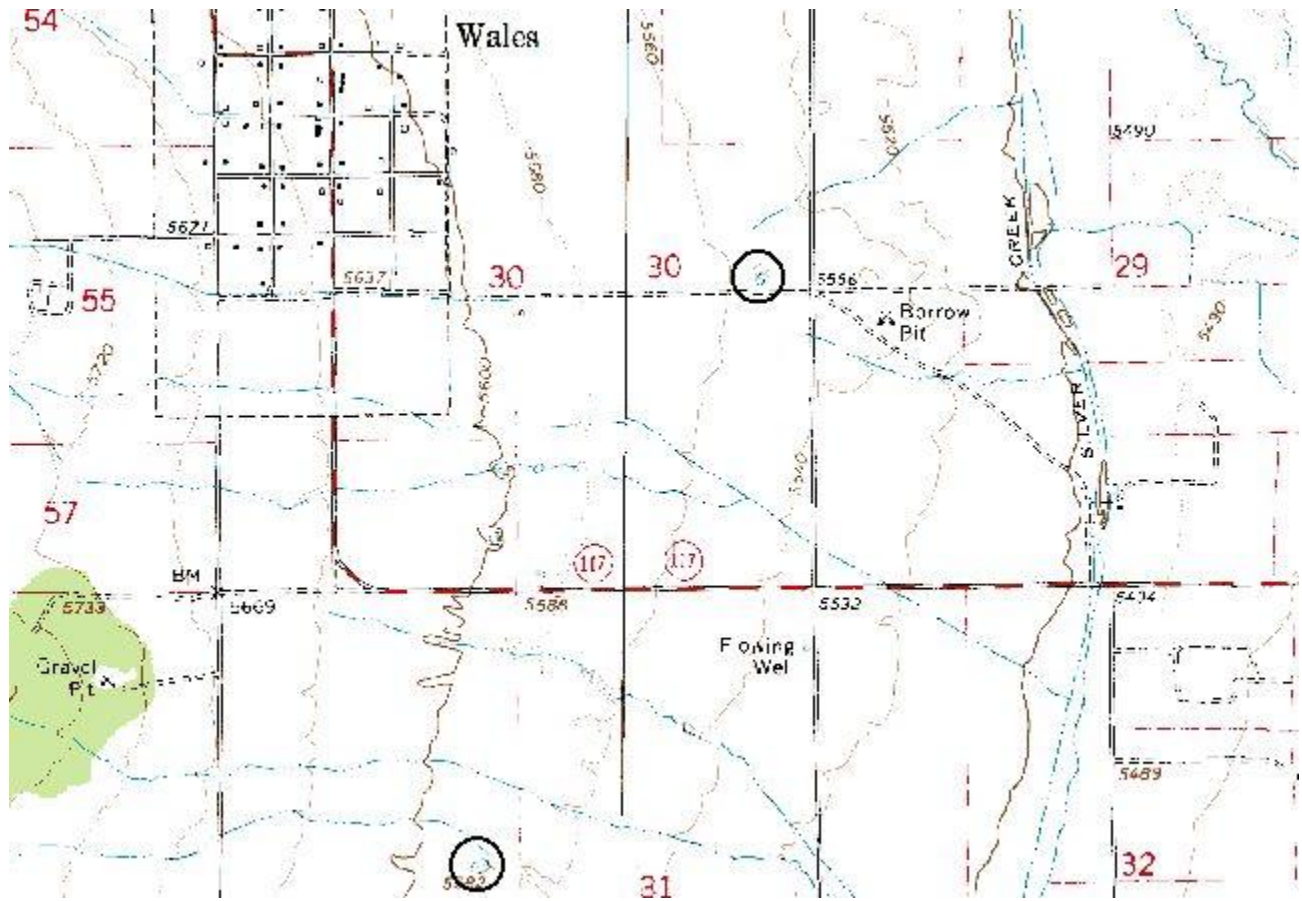
Moroni quadrangle map.

Figure 16. 2002 sweep locations in the San Pitch subunit. Survey sites were located using 7.5 minute quadrangle (topographic) maps. Survey areas are outlined.



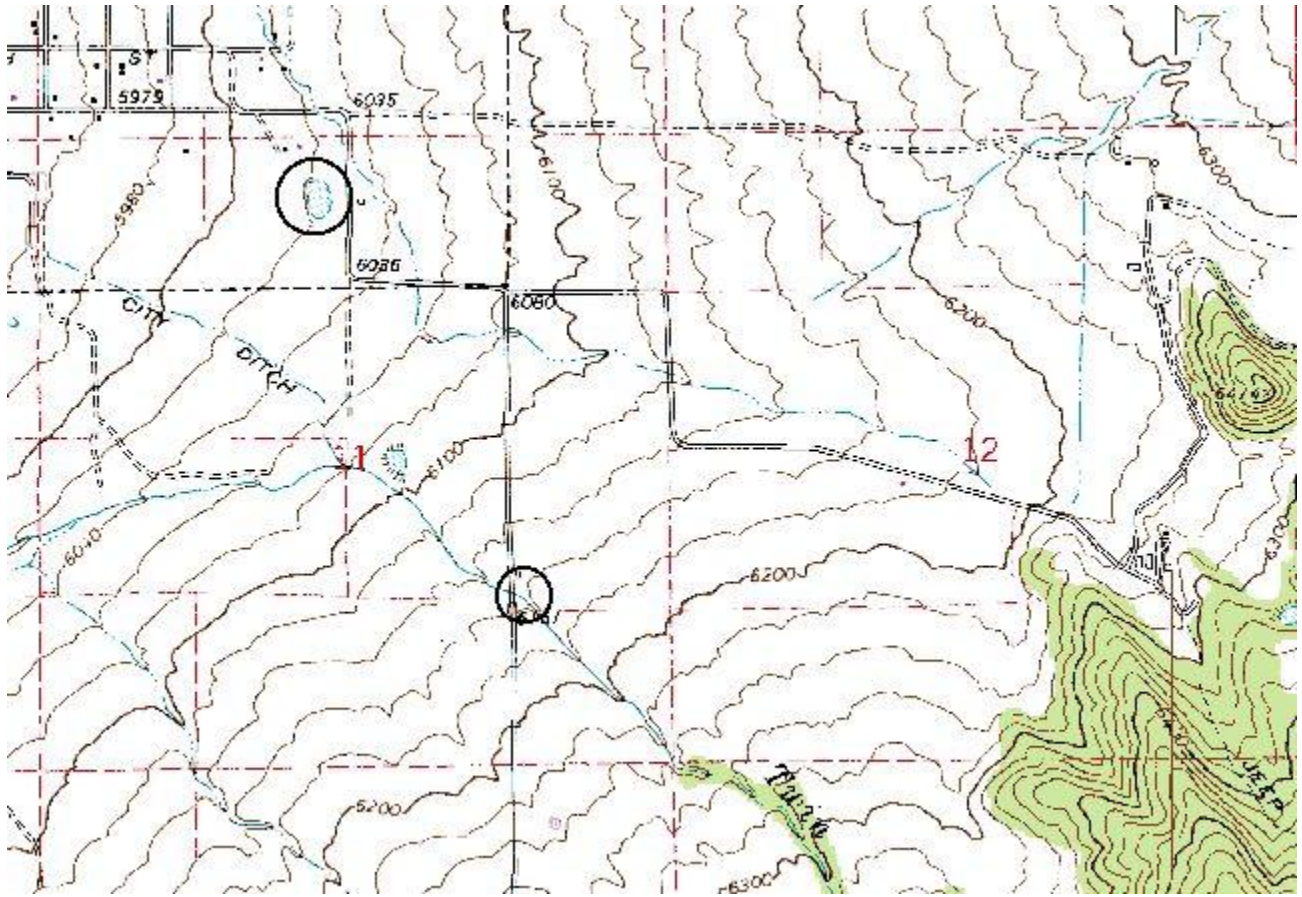
Moroni quadrangle map.

Figure 17. 2002 sweep locations in the San Pitch subunit. Survey sites were located using 7.5 minute quadrangle (topographic) maps. Survey areas are outlined.



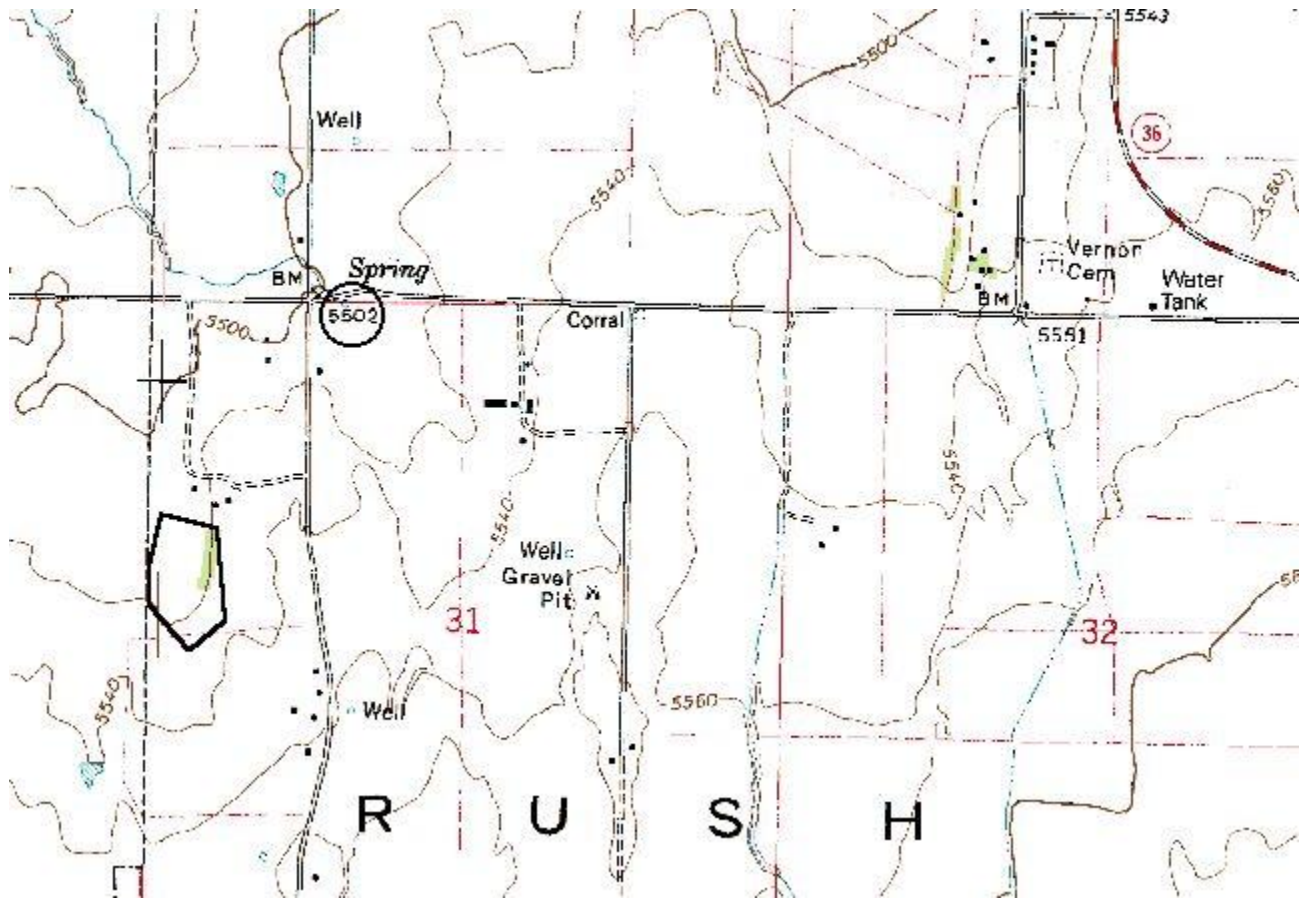
Wales quadrangle map.

Figure 18. 2002 sweep locations in the San Pitch subunit. Survey sites were located using 7.5 minute quadrangle (topographic) maps. Survey areas are outlined.



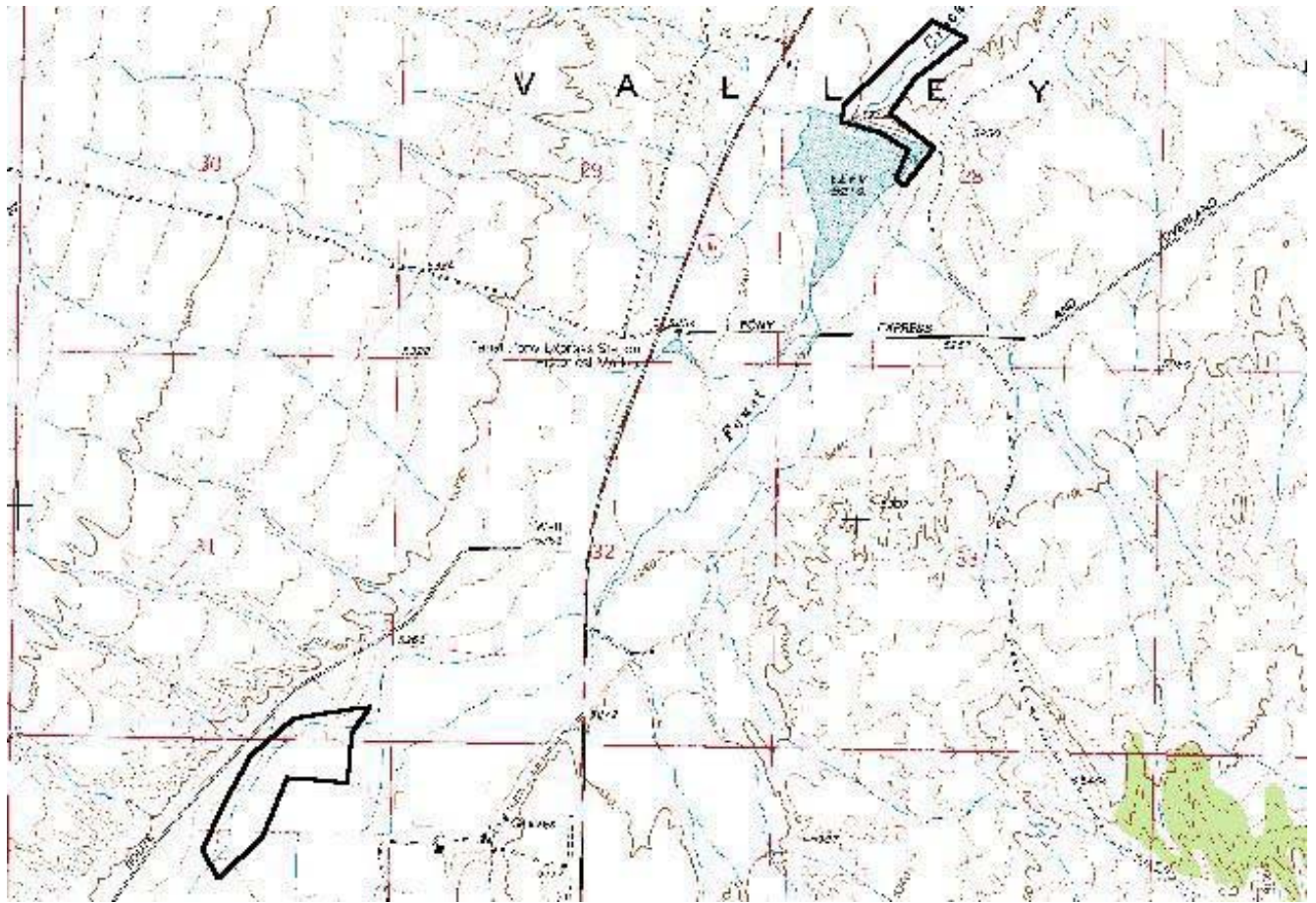
Mt. Pleasant quadrangle map.

Figure 19. 2002 sweep locations in the Tooele Valley subunit. Survey sites were located using 7.5 minute quadrangle (topographic) maps. Survey areas are outlined.



Vernon quadrangle map.

Figure 20. 2002 sweep locations in the Tooele Valley subunit. Survey sites were located using 7.5 minute quadrangle (topographic) maps. Survey areas are outlined.



Faust quadrangle map.